In the Claims

Amend claims 1-11 as follows:

1. (Currently Amended) An integrated circuit adapted for low voltage programming and differential sensing of an electronic fuse, the circuit comprising:

an electronic fuse having a first terminal and a second terminal;

a first transistor coupled to the first terminal, the first transistor configured to switch a programming voltage to the first terminal;

a second transistor coupled to the second terminal of the electronic fuse, the second transistor active during both a programming operation and a sensing operation;

a first dummy fuse coupled to the first terminal and coupled to ~~the~~ a supply voltage, the dummy fuse configured to reduce a sensing current through the electronic fuse;

a differential amplifier having a first input terminal coupled to the first terminal of the electronic fuse and a second input terminal coupled to a first voltage divider providing a reference voltage for the sensing operation; and

a gating transistor coupled to the voltage divider, the gating transistor configured to be active during the sensing operation.

2. (Original) The integrated circuit according to claim 1, wherein the programming voltage is greater than a supply voltage for the integrated circuit.

3. (Original) The integrated circuit according to claim 1, wherein the first voltage divider is comprised of a plurality of resistive elements.

4. (Original) The integrated circuit according to claim 1, wherein the dummy fuse is a resistor element.

5. (Original) The integrated circuit according to claim 1, further comprising:

an inverter providing a programming signal to the first transistor.

6. (Original) The integrated circuit according to claim 1, wherein the voltage drop across the gating transistor is substantially equal to the voltage drop across the second transistor during the sensing operation when the electronic fuse is in an unprogrammed state.

7. (Original) The integrated circuit according to claim 1, wherein a control voltage is applied to the second transistor for a period of time to perform the sensing operation, such that a variation in resistance across the electronic fuse caused by the sensing operation is limited.

8. (Original) The integrated circuit according to claim 2, wherein the programming voltage is about 1.5 times the supply voltage for the integrated circuit.

9. (Original) The integrated circuit according to claim 1, further comprising an array of electronic fuses, wherein the differential amplifier and reference voltage are coupled to the array of electronic fuses and a gating transistor is provided for each of the electronic fuses in the array.

10. (Original) The integrated circuit according to claim 9 further comprising:

a fuse selection and decode circuit having the capability to select a single fuse for programming and sensing from among the array of electronic fuses; and

a plurality of integrated circuit latches corresponding to each electronic fuse in the array, each one of the plurality of latches configured to store a digital value corresponding to a programming state of an electronic fuse in the array.

11. (Original) The integrated circuit according to claim 10 further comprising:

a second dummy fuse coupled to the first input of the differential amplifier, the second dummy fuse configured to enable incremental adjustment of the reference voltage;

a fourth transistor coupled to the second dummy fuse;

a first digital control input coupled to a gate of the fourth transistor to switch the the supply voltage to the second dummy fuse; and

an inverter having an output coupled to the gate of the fourth transistor.

12. (Original) The integrated circuit according to claim 11 further comprising:

a second voltage divider coupled to the second input of the differential amplifier, the second voltage divider configured to enable incremental adjustment of the reference voltage; and

a fifth transistor coupled to the second voltage divider and coupled to the supply voltage, the fifth transistor being driven by a second digital control input; and

13. (Original) The integrated circuit according to claim 12 further comprising:

a sixth transistor coupled to the second voltage divider and coupled to a ground potential, the sixth transistor being driven by a third digital control input.

14. (Original) The integrated circuit according to claim 13, further comprising:

a plurality of digital control inputs configured to enable incremental adjustment of the reference voltage, each one of the plurality of digital control inputs driving a transistor to switch one of a plurality of current paths; and

a complex voltage divider coupled to the second input of the differential amplifier, the complex voltage divider capable of switching a plurality of current paths corresponding to one of the plurality of digital control inputs.

15. (Currently Amended) An integrated circuit adapted for low voltage programming and differential sensing of an electronic fuse, the circuit comprising:

an inverter providing a programming signal;

a first transistor having a gate coupled to the output of the inverter, a source coupled to a power supply for the integrated circuit and a drain coupled to the first terminal, the first transistor configured to switch a programming voltage to the first terminal;

a second transistor having a gate coupled to a decoded fuse select signal, a source coupled to a ground potential and a drain coupled to ~~the~~ second terminal, the second transistor being active during both a programming operation and a sensing operation;

a differential amplifier having a first input terminal coupled to the first terminal of the electronic fuse and a second input terminal coupled to a first voltage divider providing a reference voltage for the sensing operation, the differential amplifier configured to generate a digital output signal corresponding to a programming state of the electronic fuse;

a first dummy fuse coupled to the first terminal and coupled to the supply voltage, the dummy fuse configured to reduce a sensing current through the electronic fuse; and

a gating transistor coupled to the voltage divider, the gating transistor configured to be active during the sensing operation.

16. (Currently Amended) A method of programming and sensing the state of ~~an~~ a voltage programmable electronic fuse (eFuse) in an integrated circuit, the method comprising:

selecting an electronic fuse for programming;

programming the electronic fuse;

providing a reference voltage for a sensing operation; and

comparing a voltage drop across the selected fuse for programming to ~~a~~ the reference voltage during the sensing operation.

17. (Currently Amended) The method according to claim ~~15~~ 16, further comprising:

performing the comparing step with a differential amplifier; and

storing the output of the differential amplifier in a latch.

18. (Currently Amended) The method according to claim 16, further comprising:

providing a plurality of digital control inputs;

modifying the reference voltage in discrete increments with the plurality of digital control inputs;

comparing the voltage drop across each of ~~the~~ a plurality of electronic fuses with the modified reference voltage, wherein each of the plurality of electronic fuses is sensed independently; and

characterizing the resistance of each of the plurality of electronic fuses based on the results of the comparing step.

19. (Original) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for programming and sensing an electronic fuse, said method steps comprising;

selecting an electronic fuse for programming;

programming the electronic fuse;

providing a reference voltage for the sense operation; and

comparing a voltage drop across the selected fuse for programming to a reference voltage during a sensing operation;

20. (Original) The program storage device of claim 19, further comprising:

providing a plurality of digital control inputs;

modifying the reference voltage in discrete increments with the digital control inputs;

comparing the voltage drop across each of the plurality of electronic fuses with the modified reference voltage; and

characterizing the resistance of each of the plurality of electronic fuses based on the results of the comparing step.